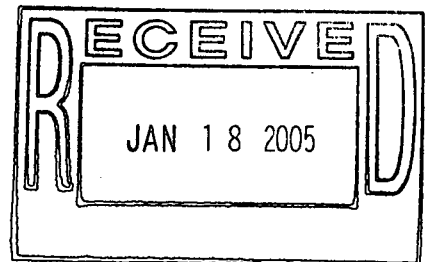


**Environmental Restoration  
RFCA Standard Operating Protocol  
for Routine Soil Remediation  
FY05 Notification #05-03  
IHSS Group 900-2**

Approval received from the U.S. Environmental Protection Agency, Region VIII

( ).

Approval letter is contained in the Administrative Record.



**January 2005**

**ADMIN RECORD**

**BZ-A-000795**

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## ACRONYMS

AAESE	Accelerated Action Ecological Screening Evaluation
AL	action level
bgs	Below ground surface
BMP	best management practice
BZ	Buffer Zone
BZSAP	Buffer Zone Sampling and Analysis Plan
COC	contaminant of concern
CRA	Comprehensive Risk Assessment
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
EDDIE	Environmental Data Dynamic Information Exchange
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation
ft	feet
FY	Fiscal Year
IHSS	Individual Hazardous Substance Site
IA	Industrial Area
IM/IRA	Interim Measure/Interim Remedial Action
IMP	Integrated Monitoring Plan
K-H	Kaiser-Hill Company, L.L.C.
MDL	method detection limit
ug/kg	microgram per kilogram
NFAA	No Further Accelerated Action
PAC	Potential Area of Concern
PCB	polychlorinated biphenyl
PCOC	potential contaminant of concern
PDF	Portable Document Format
POC	Point of Compliance
POE	Point of Evaluation
RAO	remedial action objective
RFCA	Rocky Flats Cleanup Agreement
RFETS or Site	Rocky Flats Environmental Technology Site
RL	reporting limit
RSOP	RFCA Standard Operating Protocol
SAP	Sampling and Analysis Plan
SSRS	Subsurface Soil Risk Screen
SVOC	semivolatile organic compound
VOC	volatile organic compound
WRW	wildlife refuge worker

## **1.0 INTRODUCTION**

This document constitutes a notification of intent to conduct accelerated actions on Individual Hazardous Substance Site (IHSS) Group 900-2 sites located in the Buffer Zone (BZ) at the Rocky Flats Environmental Technology Site (RFETS or Site), in accordance with and under the authority of the Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2003a). Activities specified in the ER RSOP (DOE 2003a) are not reiterated here; however, deviations are included where appropriate.

Soil with contaminant concentrations greater than the RFCA wildlife refuge worker (WRW) action levels (ALs), or as indicated by the Subsurface Soil Risk Screen (SSRS), will be removed in accordance with RFCA (DOE et al. 2003) and the ER RSOP (DOE 2003a). Ecological effects will be evaluated in the Accelerated Action Ecological Screening Evaluation (AAESE) and the ecological risk assessment portion of the Sitewide Comprehensive Risk Assessment (CRA). The consultative process will be used throughout this accelerated action.

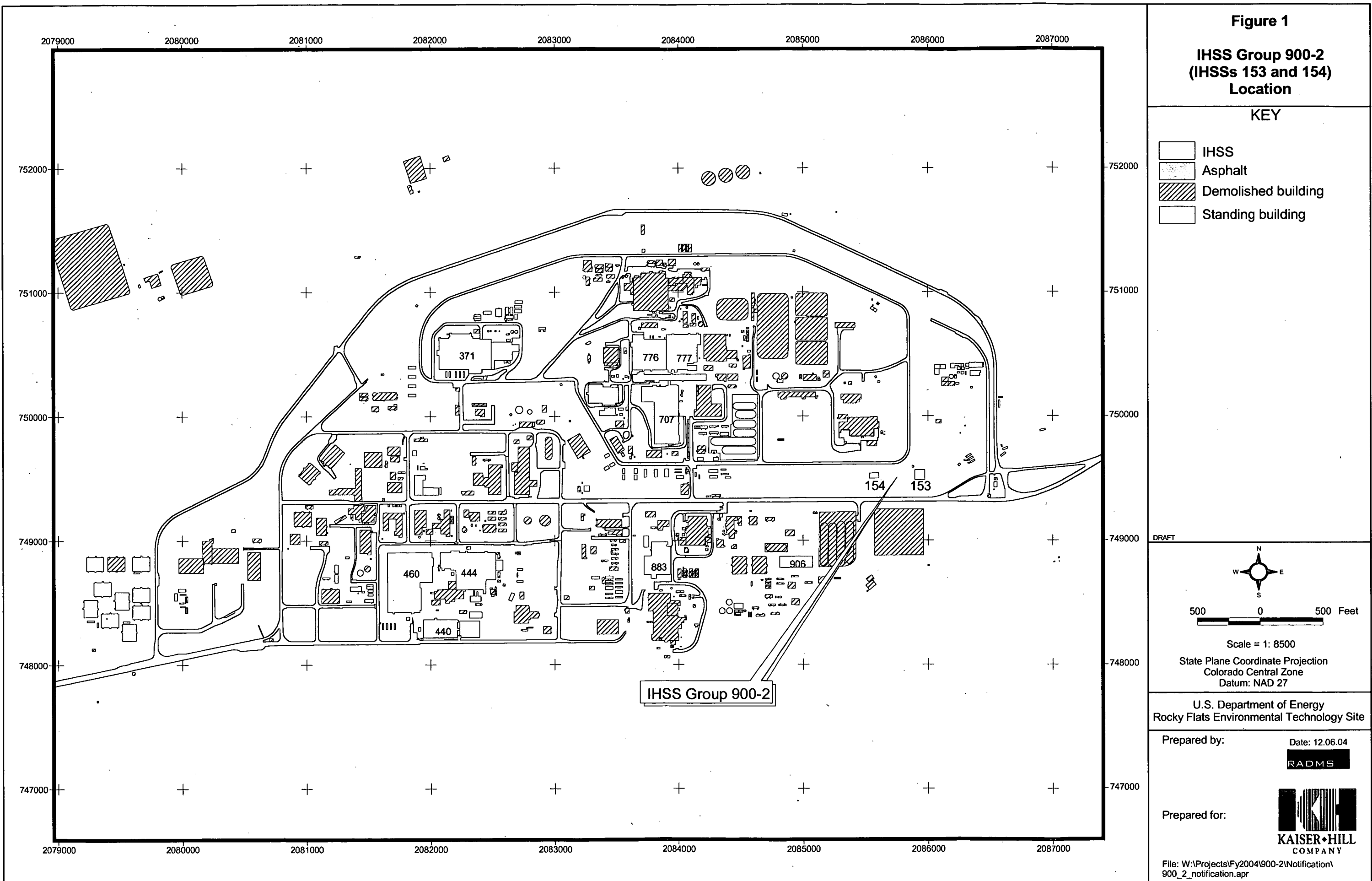
## **2.0 IHSS GROUP 900-2**

IHSS Group 900-2 consists of IHSS 900-153, Oil Burn Pit No. 2, and IHSS 900-154, Pallet Burn Site. Characterization of IHSS Group 900-2 soil is based on historical knowledge (DOE 1991, 1999), historical soil data from 3 sampling locations in the IHSS 900-153 (DOE 2002a), and recent accelerated action data from 36 sampling locations. In accordance with the BZ Sampling and Analysis Plan (SAP) (BZSAP) Addendum #BZ-02-01 (DOE 2002a), soil collected from 8 sampling locations in IHSS 153 and 6 sampling locations in IHSS 900-154 was analyzed for potential contaminants of concern (PCOCs). A total of 22 additional soil samples were collected in IHSS 900-153 to characterize the extent of soil contamination identified during the initial sampling. The location of IHSS Group 900-2 at RFETS is shown on Figure 1.

### **2.1 PCOCs and Project Conditions**

Based on historical information, metals, polychlorinated biphenyls (PCBs), and volatile organic compounds (VOCs) were identified as PCOCs in IHSS Group 900-2 soil and were the focus of accelerated actions conducted under BZSAP Addendum #BZ-02-01 (DOE 2002a). The results of accelerated action sampling indicate metals, radionuclides, PCBs, and VOCs are present in IHSS Group 900-2 surface and subsurface soil at concentrations greater than reporting limits (RLs) or background means plus two standard deviations. Concentrations greater than WRW ALs are only present in subsurface soil and are distributed as follows:

- Arsenic in soil collected from 4.5-6.5 feet (ft) below ground surface (bgs) at two sampling locations (CN40-001 and CO40-000);



- PCBs (Aroclor-1254 and Aroclor 1260) in soil collected from 4.5-6.5 ft bgs at one sampling location (CQ40-000);
- VOC (tetrachloroethene) in soil collected from 2.5-4.5 ft bgs at one sampling location (CQ41-001);
- PCBs (Aroclor-1254 and Aroclor-1260) and VOCs (tetrachloroethene and trichloroethene) in soil collected from 2.5-10.5 ft bgs at one sampling location (CQ41-005); and,
- VOCs (tetrachloroethene and trichloroethene) in soil collected from 2.5-4.5 ft bgs at one sampling location (CQ41-025).

Figure 2 describes the locations of the 36 accelerated action samples and divides them into 3 categories: (1) sample locations with concentrations greater than ALs; (2) sample locations with concentrations greater than background plus two standard deviations or RLs; and (3) sample locations with non-detected concentrations.

## **2.2 RFCA SSRS Evaluation**

A SSRS is performed when non-radionuclides or uranium are present in soil 0.5 ft bgs or more, or when americium-241 or plutonium-239/240 are present 3 ft bgs or more. Current site conditions were evaluated using available data to determine whether remediation is required by the SSRS. An SSRS will be conducted again after the accelerated action and related confirmation sampling tasks are completed. The accelerated actions taken, confirmation results, and a revised SSRS will be documented in the IHSS Group 900-2 Closeout Report.

The SSRS follows the steps identified on Figure 3 in Attachment 5 of RFCA (DOE et al. 2003):

### **Screen 1 – Are the contaminant of concern (COC) concentrations below Table 3 WRW Soil Action Levels?**

No. Analytical results indicate that the following COCs are above WRW ALs: arsenic, Aroclor-1254, Aroclor-1260, tetrachloroethene, and trichloroethene. All other COCs are below WRW ALs.

### **Screen 2 – Is there potential for subsurface soil to become surface soil (landslide and erosion areas identified on Figure 1)?**

No. IHSS Group 900-2 is not located in an area subject to high erosion or landslides in accordance with Figure 1 of RFCA (DOE et al. 2003). IHSS Group 900-2 is in an area adjacent to a proposed functional channel.

### **Screen 3 – Does subsurface soil radiological contamination exceed criteria in Section 5.3 and Attachment 14?**

No. Radiological contamination is not a COC for IHSS Group 900-2.

Figure 2

IHSS Group 900-2  
Accelerated Action  
Soil Sampling Results  
and Potential Areas  
of Remediation

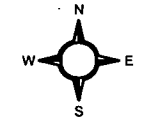
KEY

- Sampling location with concentrations greater than WRW ALs
- Sampling location with concentrations less than WRW ALs but greater than RLs or background\*
- Sampling location with concentrations less than RLs

- Potential remediation area
- IHSS
- Asphalt
- ▨ Demolished building

\* background equal to background mean plus two standard deviations

DRAFT



100 0 100 Feet

Scale = 1: 1,300

State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD 27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

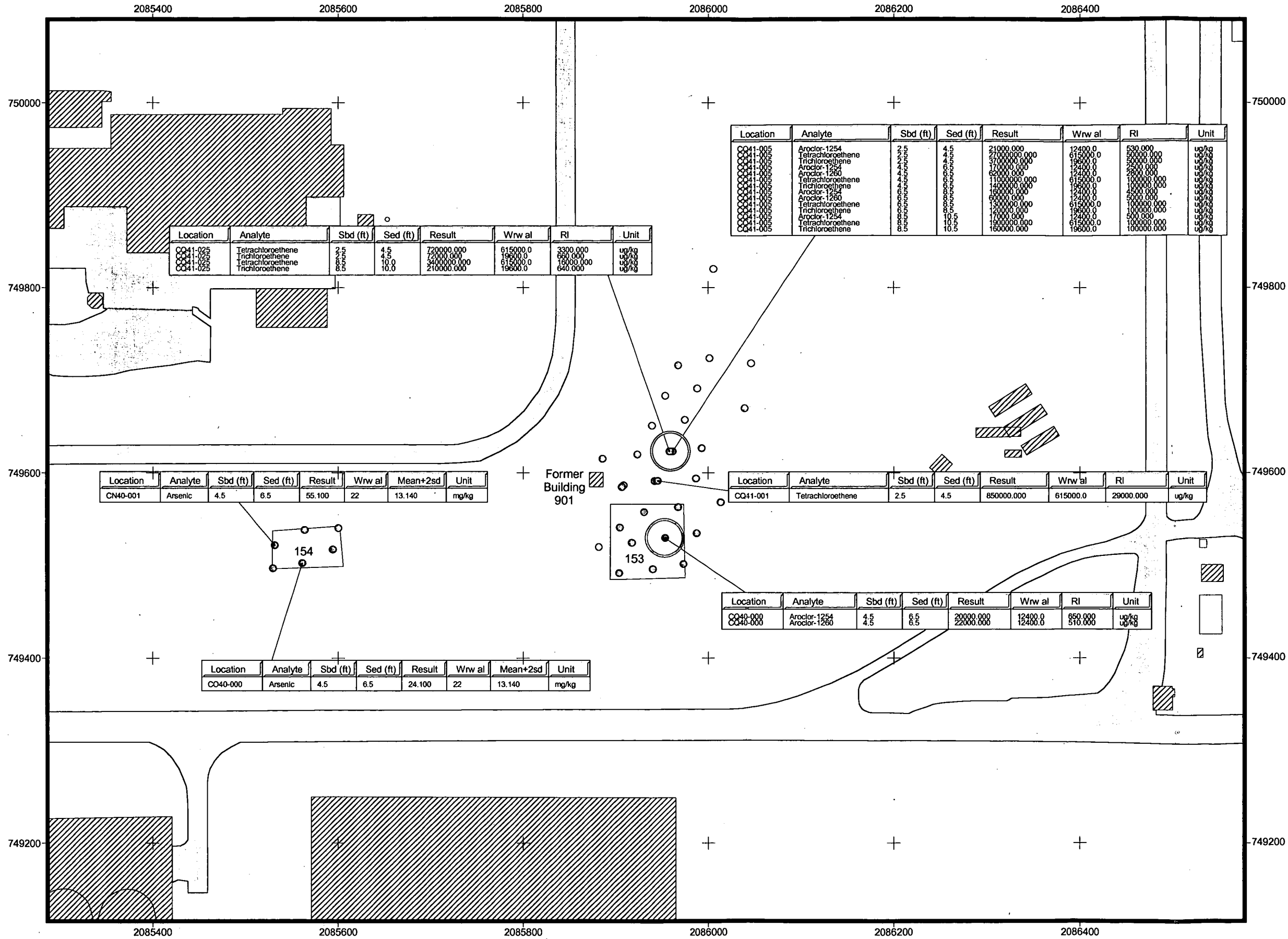
Prepared by: Date: 12.06.04

RADMS

Prepared for:



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**Screen 4 – Is there an environmental pathway and sufficient quantity of COCs that would cause exceedance of the surface water standards?**

Yes. Contamination migration via groundwater is the primary pathway whereby surface water could become contaminated by IHSS Group 900-2. The latest Groundwater Interim Measure/Interim Remedial Action (IM/IRA) documentation lists IHSS 900-153 as a "...localized but diffuse source of VOCs and PCBs." Based on the review of Figure 1 in Attachment 5 of RFCA (DOE, et al. 2003), IHSS Group 900-2 sites are located in a stable area that is not prone to landslides or high erosion. In addition, the current Site reconfiguration plan indicates that this area is not a proposed cut area, but is adjacent to the proposed functional channel FC-5. The presence of the functional channel is not expected to impact the IHSS Group 900-2.

The groundwater contamination is attributable to IHSS 900-153 (Oil Burn Pit No. 2), the Mound Site (source removal completed in FY97 [DOE 1997]), and the 903 Pad (source removal completed in FY04 [DOE 2004b]). The source areas extend northward toward South Walnut Creek. Near South Walnut Creek, the plume is captured and treated by the Mound Site Plume groundwater collection and treatment system that was installed in 1998 (DOE 2004a). Results of a June 2003 sampling of groundwater monitoring well 11897, located approximately 425 feet northeast of IHSS 900-153, indicate that tetrachloroethene and trichloroethene are present at concentrations of 730 micrograms per liter (ug/L) and 100 ug/L, respectively. The RFCA Tier I and Tier II ALs for these analytes in groundwater are 500 ug/L and 5 ug/L, respectively. No other analytes were detected in groundwater at concentrations greater than the RFCA Tier I and Tier II ALs. Further groundwater evaluation will be conducted as part of the Integrated Monitoring Plan (IMP), the groundwater plume remedial decision and future Sitewide evaluation.

Excavation of the PCB contaminated soils is the primary driver for this action. In addition, this removal action will also reduce the amount of collocated VOC contamination in the soil (DOE 2004a).

### **2.3 ER Remediation Plan**

The RSOP Notification remediation plan for IHSS Group 900-2 includes the following objectives:

- Remove soil with non-radionuclide or uranium contaminant concentrations greater than the WRW ALs to a depth determined through the consultative process.
- Following the removal of contaminated soil, collect confirmation soil samples in accordance with the BZSAP (DOE 2002c).

The WRW AL exceedances of PCBs in subsurface soil at sampling locations CQ40-000 (inside the IHSS 900-153 boundary) and CQ41-005 (north of the IHSS 900-153 boundary) require remediation. Soil at these two sampling locations will be removed until PCB concentrations are less than WRW ALs. Confirmation sampling will be collected from the bottom of the excavations and the excavation sidewalls in accordance with the consultative process. The potential remediation areas are shown on Figure 2.



The WRW AL exceedances of arsenic in subsurface soil at two sampling locations (CN40-001 and CO40-000) do not require remediation under RFCA (DOE et al. 2003) because the soil is at a depth of 4.5 ft bgs.

The WRW AL exceedances of VOCs in subsurface soil at three sampling locations (CQ41-001, CQ41-005 and CQ41-025) do not require remediation based on the SSRS evaluation. However, two of the three exceedances (sampling locations CQ41-005 and CQ41-025) will be coincidentally remediated because they are associated with the PCB exceedance at sampling location CQ41-005.

After remediation, surface and subsurface soil with concentrations of PCBS, and VOCs greater than the background means plus two standard deviations or RLs may remain at IHSS Group 900-2. Concentrations greater than WRW ALs may remain in the subsurface, however, they would be limited to arsenic at two sampling locations (CN40-001 and CO40-000) and tetrachloroethene at one sampling location (CQ41-001). As the accelerated action progresses, invoking the consultative process may be necessary to conclude the action.

## **2.4 Stewardship Evaluation**

Based on the PCOCs and the ER RSOP (DOE 2003a), it is anticipated that contamination within IHSS 900-153 above RFCA ALs will be remediated. Figure 2 shows the potential remediation areas.

An additional stewardship evaluation will be conducted during remediation using the consultative process and documented in a Closeout Report for IHSS Group 900-2. A new map of residual contamination will be generated after remediation. The following sections present the stewardship evaluation.

### **2.4.1 Proximity to Other Contaminant Sources**

IHSS Group 900-2 is in the RFETS BZ and is located in close proximity to IHSSs 900-155, -108, -113 and -190. These IHSSs lie to the east and south of IHSS 900-153. All of these IHSSs have No Further Accelerated Action (NFAA) status except for IHSS 900-155, which has undergone remediation. NFAA has been requested for the site in the IHSS Group 900-11 Closeout Report.

### **2.4.2 Surface Water Protection**

Surface water protection includes the following considerations:

#### ***Is there a pathway to surface water from potential erosion to streams or drainages?***

No. Contaminants in soil from IHSS Group 900-2 could be eroded causing impacts to surface water; however IHSS Group 900-2 is not located in an area subject to erosion or landslides in accordance with Figure 1 of RFCA (DOE et al. 2003), and existing soil data for IHSS Group 900-2 indicate that contaminant concentrations greater than WRW ALs are only present in subsurface soils. This area is adjacent to the proposed functional

channel (FC-5) which runs to the northeast and is located east of IHSS 900-153, however, FC-5 is not expected to impact IHSS Group 900-2.

***Do characterization data indicate there are contaminants in surface soil?***

No. Existing soil data for IHSS Group 900-2 indicate contaminant concentrations of arsenic, PCBs, and VOCs greater than WRW ALs are only present in subsurface soils.

***Do monitoring results from Points of Evaluations (POEs) or Points of Compliance (POCs) indicate there are surface water impacts from the area under consideration?***

No. Groundwater in the area flows northeast towards South Walnut Creek where it is captured and treated by the Mound Site Plume Treatment System before it is discharged to surface water.

The nearest surface water POE downstream of IHSS Group 900-2 is GS10. Flow at GS10 is in South Walnut Creek above the B-1 Bypass. This POE has had reported exceedances of water quality standards; however, GS10 receives water from a large part of the adjacent Industrial Area (IA), and surface water quality at this location may not be attributable to any single upgradient IHSS Group (DOE 2003b). Final characterization data for IHSS Group 900-2 will be evaluated in the Closeout Report.

***Is the IHSS Group in an area with high erosion potential?***

No. IHSS Group 900-2 is located near an area subject to erosion in accordance with Figure 1 of the RFCA Modification (DOE et al. 2003). Flow from IHSS Group 900-2 is routed to the north and northeast where it forms the headwaters of South Walnut Creek. Specifically, IHSS 900-153 is adjacent to a section of the proposed functional channel (FC-5) which is not expected to impact the erosion potential of IHSS Group 900-2.

### **2.4.3 Monitoring**

Monitoring includes the following considerations:

***Do monitoring results from POEs or POCs indicate there are groundwater impacts from the area under consideration?***

Yes. The Site plume location map (DOE 2002b) indicates that IHSS Group 900-2 is located adjacent to multiple areas of groundwater contamination. Groundwater east (down gradient) and north (upgradient) of IHSS Group 900-2 is contaminated with VOCs. The contamination is attributable to the IHSS 900-153, the Mound Site (source removal completed in FY97 [DOE 1997]), and the 903 Pad (source removal completed in FY04 [DOE 2004b]). A groundwater collection and treatment system is currently operating for this portion of the plume.

Excavation of the PCB-contaminated soil is the primary driver of this notification and accelerated action. However, this removal action will also reduce the amount of collocated VOC contamination in the soil at this location (DOE 2004a). Further groundwater evaluation will be conducted as part of the IMP, the groundwater plume remedial decision and future Sitewide evaluation.

***Can the impact be traced to a specific IHSS Group?***

No, but this is one of several IHSS Groups contributing to the problem.

***Are additional monitoring stations needed?***

Not applicable at this time. The need for and placement of monitoring stations will be re-evaluated in the Long-Term Stewardship Plan.

***Can existing monitoring locations be deleted if additional remediation is conducted?***

Not applicable at this time. Existing wells monitor contamination from areas outside IHSS Group 900-2.

**2.4.4 Stewardship Actions and Recommendations**

The current stewardship actions and recommendations for IHSS Group 900-2 are as follows:

- Use best management practices (BMPs) to reduce erosion into surface water drainage.
- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following:
  - Restrict access; and
  - Control soil excavations through the Site Soil Disturbance Permit process.
- Implement long-term stewardship actions, including the following:
  - Prohibit construction of buildings in the area; and
  - Restrict excavations or other soil disturbances.

These recommendations may change based on in-process remediation activities and other future RFETS remediation decisions.

**2.5 Accelerated Action Remediation Goals**

ER RSOP remedial action objectives (RAOs) include the following:

- Provide a remedy consistent with the RFETS goal of protection of human health and the environment;
- Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls; and
- Minimize the spread of contaminants during implementation of accelerated actions.

**2.6 Treatment**

The Mound Site collection and treatment system was installed in 1998 and continues to operate.

## **2.7 Project-Specific Monitoring**

The need and placement of high-volume air samplers to determine airborne radioactivity activities at the remediation area will be determined as part of the work control package. Since radioactivity is not a PCOC for this notification, the potential location for an air sampler is not provided.

## **2.8 Resource Conservation and Recovery Act Units and Intended Waste Disposition**

Not applicable.

## **2.9 Administrative Record Documents**

DOE, 1991, Assessment of Known, Suspect, and Potential Environmental Releases of Polychlorinated Biphenyls (PCBs), Preliminary Assessment/Site Description, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1992-2004, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado.

DOE, 1997, Closeout Report for the Source Removal at the Mound Site IHSS 113, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2002, Buffer Zone Sampling and Analysis Plan Addendum #BZ-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002, Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2002, Second Quarter RFCA Groundwater Monitoring Report, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Modification 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, Automated Surface-Water Monitoring Report, Water Year 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2004a, DRAFT IM/IRA for Groundwater at the Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004b, DRAFT IHSS 112 903 Pad Closeout Report. Rocky Flats Environmental Technology Site, Golden, Colorado, December.

## **2.10 Projected Schedule**

Remediation of IHSS Group 900-2 is expected to begin in the second quarter of FY05.

## **3.0 PUBLIC PARTICIPATION**

ER RSOP Notification #05-03 activities will be discussed at the January 2005 ER/Decontamination and Decommissioning (D&D) Status meeting. A Portable Document Format (PDF) version of this Notification was provided to the local governments. This Notification is available at the Rocky Flats Reading Rooms and on the Environmental Data Dynamic Information Exchange (EDDIE) Website at [www.rfets.gov](http://www.rfets.gov).

## **4.0 REFERENCES**

DOE, 1991, Assessment of Known, Suspect, and Potential Environmental Releases of Polychlorinated Biphenyls (PCBs), Preliminary Assessment/Site Description, Rocky Flats Plant, Golden, Colorado, October.

DOE, 1997, Closeout Report for the Source Removal at the Mound Site IHSS 113, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 1999, Annual Historical Release Report for the Rocky Flats Plant, Golden, Colorado, September.

DOE, 2002a, Buffer Zone Sampling and Analysis Plan Addendum #BZ-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, April.

DOE, 2002b, Second Quarter RFCA Groundwater Monitoring Report, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002c, Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2003a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Modification 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Automated Surface-Water Monitoring Report, Water Year 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2004a, DRAFT IM/IRA for Groundwater at the Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2004b, DRAFT IHSS 112 903 Pad Closeout Report. Rocky Flats Environmental Technology Site, Golden, Colorado, December.